ONTARIO POPULATION PROJECTIONS

PRESENTATION TO
THE SELECT COMMITTEE ON ONTARIO HYDRO AFFAIRS

Social and Economic Data
Central Statistical Services
Ministry of Treasury and Economics

January 11, 1979

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Projecting population is like most forecasting exercises, one in which one should engage once and then disappear into some other activity where one cannot be caught with one's past performance. The Ontario Government and particularly the Ministry of Treasury and Economics have had to live with their projections over the decades so we have a continuing process of review and revision. The beginnings of the present projection exercises started twenty years ago with the 1956 Census data. We will show you the results of the quinnquenial projections of the past in comparison with actual population changes. We will also report an evaluation made by Dr. Cicely Watson of the Ontario Institute of Education on the reliability of various population projections for Ontario

The current projections are based on the 1976 Census data. They reflect present social and economic trends and present government policies toward immigration. Our most recent projections indicate a much slower rate of

growth than did those made in 1974 and, if fertility rates continue to decline as they are now doing and immigration from abroad remains at the rather low current levels, the population of Ontario will rise from 8 1/4 million in 1976 to just over 10 million by the year 2001. This represents a considerable reduction in the projected growth from the previous projection based on the trends of the sixties. (See Chart 1)

To put these projections in perspective it might be useful to look at them in terms of annual rates of increase. The most rapid population growth occurred in the fifties with an annual increase rate of 3.3 per cent from 1951-1956 and 2.8 per cent from 1956 to 1961. This has declined very sharply and for the period 1971-1976 averaged only 1.4 per cent. Because the factors affecting that decline are still at work - declining fertility and reduced immigration levels - the projections show a continuing gradual decline in the rate of population growth from now to 2001.

In order that you may better understand the value and limitations of population projections as a planning tool

I will give you a brief description of the methodology and the factors which influence population change. (Chart 2)

The method used by Ontario has from the beginning of the present exercise in 1956 been the component method. Revision of the population projections for Ontario is undertaken periodically as current information becomes available. The first set of projections based on the 1976 Census data is now completed. In simple terms the methodology used for these projections is the same as that used for those done on the basis of the 1956 Census. The major difference is that we now use a computer to undertake the calculations rather than a group of clerks with calculators and this permits us to look at alternative scenarios of future trends.

The general methodology used is to start from a base period - the Census data - with the population by age and sex, moving this population forward through time, aging it year by year and adding and subtracting for changes.

To the base population are added each year the new babies born during the year. These are calculated by using age specific fertility rates for women aged 15-49. The fertility rates are projected on the basis of past trends and the current outlook.

Deaths during the year are calculated on the basis of projected age specific death rates by sex and the number

is subtracted from the base population each year. Mortality rates for most age groups have little room for improvement but declines in death rates are continuing and projected to continue in the under one year age group and in the over 50's.

The net gain from population movements into and out of the Province then has to be added to the base population each year. The total net immigration is assumed at various rates depending on the economic and political climate for immigration. This process is continued year by year over the projection period. Both international migration and population movement between the provinces in Canada are taken into account in making the assumptions regarding net migration.

The methodology indicates what factors are taken into account in the projection process but the main concern of most persons involved in planning is which factors are the most variable and unpredictable and what assumptions have been made for the projections under discussion.

We can almost dismiss a number of the variables in the projection process under current conditions. The base population from Census of Canada is considered reasonably reliable so this does not present a problem for most purposes. Central Statistical Services projections start from the 1976 Census population by single years of age and sex.

The mortality rates are fairly stable and where there is still room for improvement the trends toward longevity are gradual and the projections present no difficulties. For the current projections we assumed little change in mortality in the age groups from 5-50 as death rates are very low in those ages. Infant survival rates are projected to continue to improve and gradual improvement is also projected for the population over 50, both male and female. Any drastic change in life style disease rates could result in more rapid improvement in survival rates for the over 50's, but such changes do not appear to be on the immediate horizon.

The two areas which present the greatest challenge in making projections are fertility rates and population movements.

Fertility rates appear to be affected by economic conditions, society's attitudes toward children, social and economic stability, and all of the myriad factors which affect life styles and human choices. To date, in the present round, one population projection series based on low fertility rates has been prepared. The fertility rates for the Province as a whole are based on historical trends in fertility and a general overview of present trends. These are projected on a curve basis. Current figures show that fertility is still declining, so the curve has been extended and this will reach a low point before the turn of the century. The low is expected to be about 1.5 total fertility rate.*

*Total fertility Rate is the number of children a woman will have throughout her lifetime if she experiences at each age the fertility in effect during the period concerned.

Most demographers have been very reluctant to accept the possibility of such low fertility rates, as a population in a Western industrialized country requires a rate of between 2.1 and 2.2 total fertility for the population to replace itself. However, many European countries have rates of 1.5 or lower now, and some countries - Czechoslovakia, Hungary and Romania - have even taken drastic measures to give economic incentives to increasing the births. Such incentives have had mixed success in the past. There seems little possibility of this kind of action in Canada in the immediate future, hence we felt that a continuation of present trends was the most likely.

Chart #3 shows the change in fertility rates over the past few years and the difference as a result of using a curved line trend rather than a straight line trend, even when the fertility rate is the same for the final projection date. Improvements in the technology used permitted this improvement in the projection process and current data show births in 1978 as being very close to the projected number.

In the past, immigration has accounted for about forty per cent of Ontario's population growth and as Chart #4 indicates, the levels of net migration vary widely from year to year and it is immigration which causes the greatest change in the rates of population growth. The immigration levels are dependent on a number of variables - the relative economic opportunities in the country of origin and

the country of destination, the ease or difficulty of movement which includes immigration quotas (in some countries), accessibility to information about the place of intended destination, cost of moving, jurisdictional and procedural ease or difficulty of immigrating and possibilites of sociological integration in the new area. Emigration takes into account the same factors. Our information on immigration is quite reliable but for emigration our estimates are based on the residual difference from one Census to the next.

In addition to net immigration from outside the country, account must be taken of inter-provincial movements. Ontario, during most of the period from 1920 to the early seventies, gained population from these inter-provincial shifts. In recent years the economic pull to Alberta and British Columbia resulted in some net loss to Ontario, but in the past couple of years movement of population from Quebec and the Maritimes has approximately balanced the losses to the west. The general westward shift of population is expected to continue over the forecast period so immigration from abroad is the most significant factor in net migration to Ontario.

Net immigration to Ontario has varied from a high of 130,000 in 1956 to an estimated 20,000 in 1978.

The current first projection was made on the basis of a total net gain of 30,000 people per year resulting from movements into and out of the Province. This figure will depend largely on federal policies on immigration and is not basically a demographic factor. It appears reasonable based on current economic conditions. The Federal Government will probably continue to have a fairly open immigration policy for the underdeveloped countries and these people will be attracted to areas where friends and relatives have settled - Ontario. Internal movement in Canada is likely to continue its westward flow in the foreseeable future.

Your interest like that of most of our users in population projections is for quite specific purposes and we understand that, as for any projections these must be evaluated in terms of the consequences of over or under estimation. We have, therefore, when resources were available, produced a range of projections which give an indication of the effects of changes in the factors affecting population change on the overall total. Because the Ontario projections are used largely for short to medium term planning, in consultation with other people in the business, we have selected the set of projections which is in closest conformity with current trends. Where forward planning time is very long, continuing review of the factors involved is necessary.

We are in the process of developing alternative fertility rate projections and can not at this time give you estimates of the effect of changes in such rates 25 years hence. However, actual changes in fertility rates do give us a substantial lead time on the demand for housing, labour force growth, etc.

The area which has the most erratic and immediate impact on population change is immigration. With the current set of forecasts we have projected a net gain of 30,000 per year to Ontario. However, a rough guide line regarding the impact of immigration is that with the low fertility assumption used in these projections, every 10,000 additional immigrants per year would result in a total increase in population by the year 2001 of slightly more than 300,000. Thus if net migration to Ontario averaged 50,000 per year, population in 2001 would total 10.7 million rather than the 10.1 resulting from net immigration of 30,000 per year.

In making use of these projections and evaluating their reliability you may want to see how reliable they have been in the past and how they compare with those of other demographers.

Chart #5 shows the past projections made by the demographic unit of Treasury in comparison with actual changes. As you can see from the chart, projections for the first five years of each projection period have been quite reliable and for the first ten years have been satisfactory. For longer

periods, the picture becomes a little less clear. Changes in attitudes toward children, economic changes both in Ontario and in the areas from which we draw population, and Federal Government activity in the area of immigration result in changes in the overall shifts in population trends which make long term projection rather risky and this is why these trends are kept under continuing review.

I would like to quote from a commentary on population projections made by Dr. Cicely Watson of the Ontario Institute for Studies in Education in the Interim Report of the Commission on Declining Enrolments in Ontario, February 28, 1978.

"Over the years the OISE team and the Ministry *(of Education)* have been provided with population forecasts produced by a number of groups but only the Central Statistical Services of TEIGA have consistently produced detailed projections of high utility. Our chief criticism of them has been that they are a multipurpose product whose prime interest has been to achieve overall accuracy".

"On balance these are very good forecasts, as technically excellent as any being produced, and some of CODE's twenty year enrolment projections will be based on the new TEIGA population projections, expected in April 1978".

Dr. Watson noted that the projections calculated in 1964 for the Ontario population of 1966, 1971 and 1976 experienced only a quite reasonable error: "In any case an error of 15 years forward of only +0.85% is an extraordinary event, an achievement which no demographer would expect to repeat!"

Chart 1

POPULATION OF ONTARIO

PROJECTIONS

Based on 1976 Census Data.

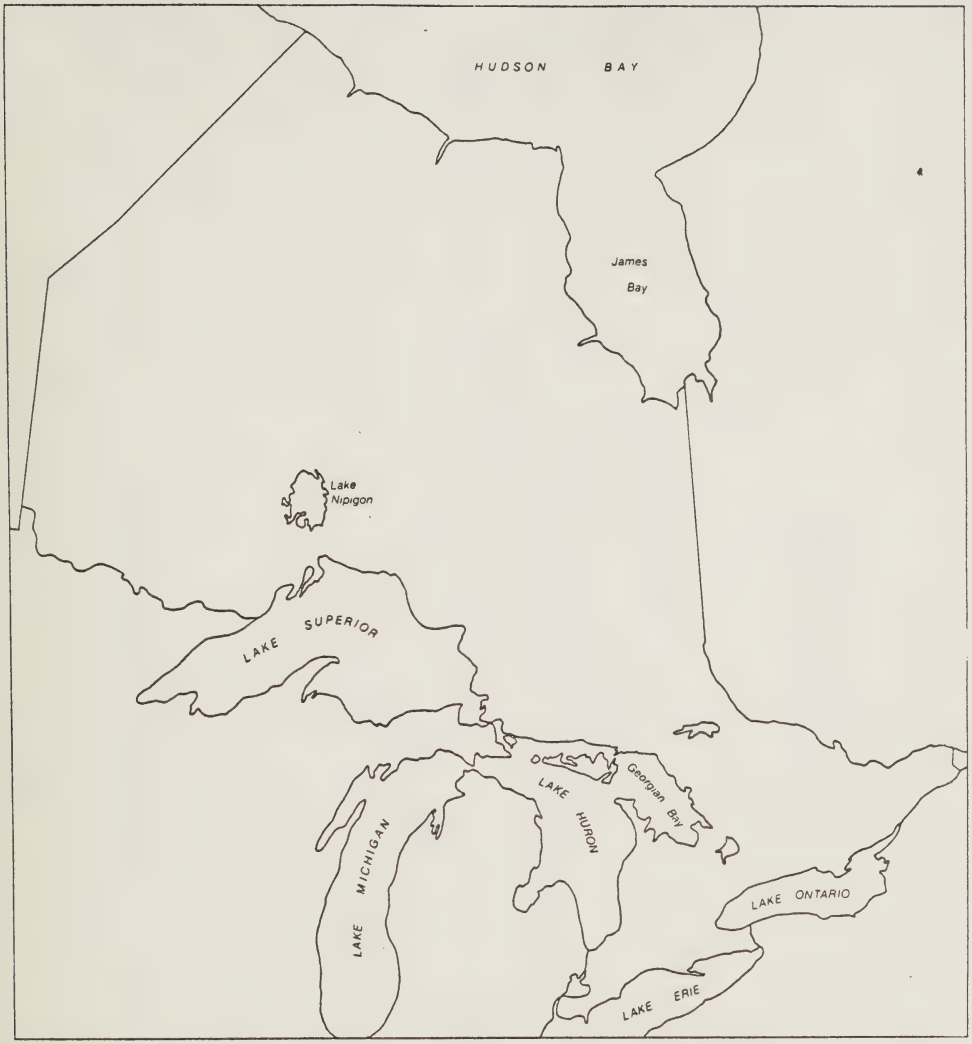
Actual 1976	-	8 1/4 million
Low Projection 2001	-	10+ Million

ASSUMPTIONS

Low Projection

Fertility	-	Continuing decline from 1.8 in 1976 to 1.5 in 2001
Mortality	-	Continuing gradual improvement in survival rates for under 1 year olds and over 50 year olds.
Net Immigration	-	30,000 per year.

Chart 2



ONTARIO POPULATION PROJECTION

POPULATION (BASE PERIOD)

	PLUS	MINUS
1.	BIRTHS	DEATHS
2.	IMMIGRATION FROM ABROAD	EMIGRATION FROM ONTARIO
3.	MOVEMENT TO ONTARIO FROM OTHER PROVINCES	MOVEMENT FROM ONTARIO TO OTHER PROVINCES

= POPULATION AT END OF PROJECTION PERIOD

Chart 3

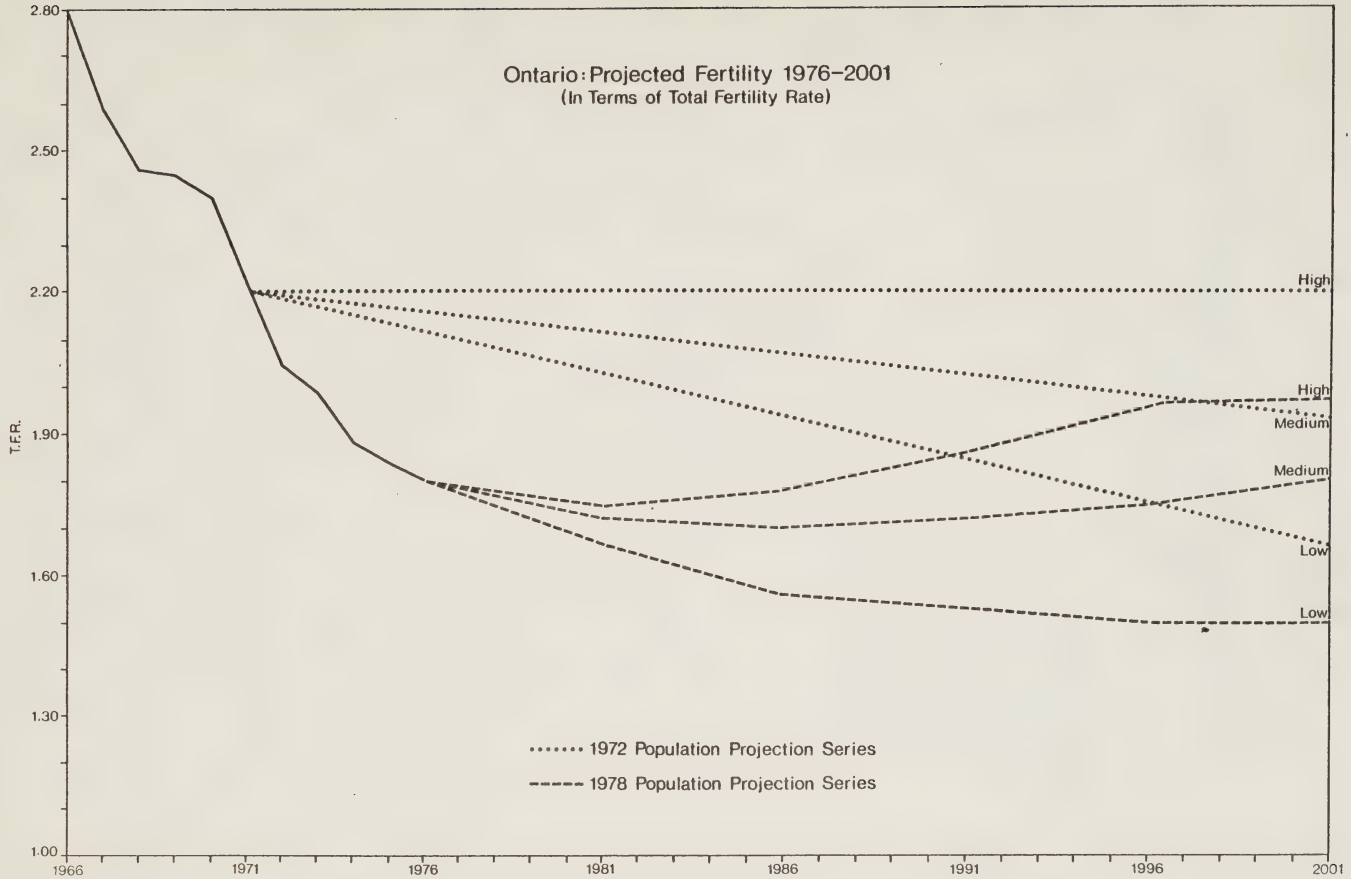
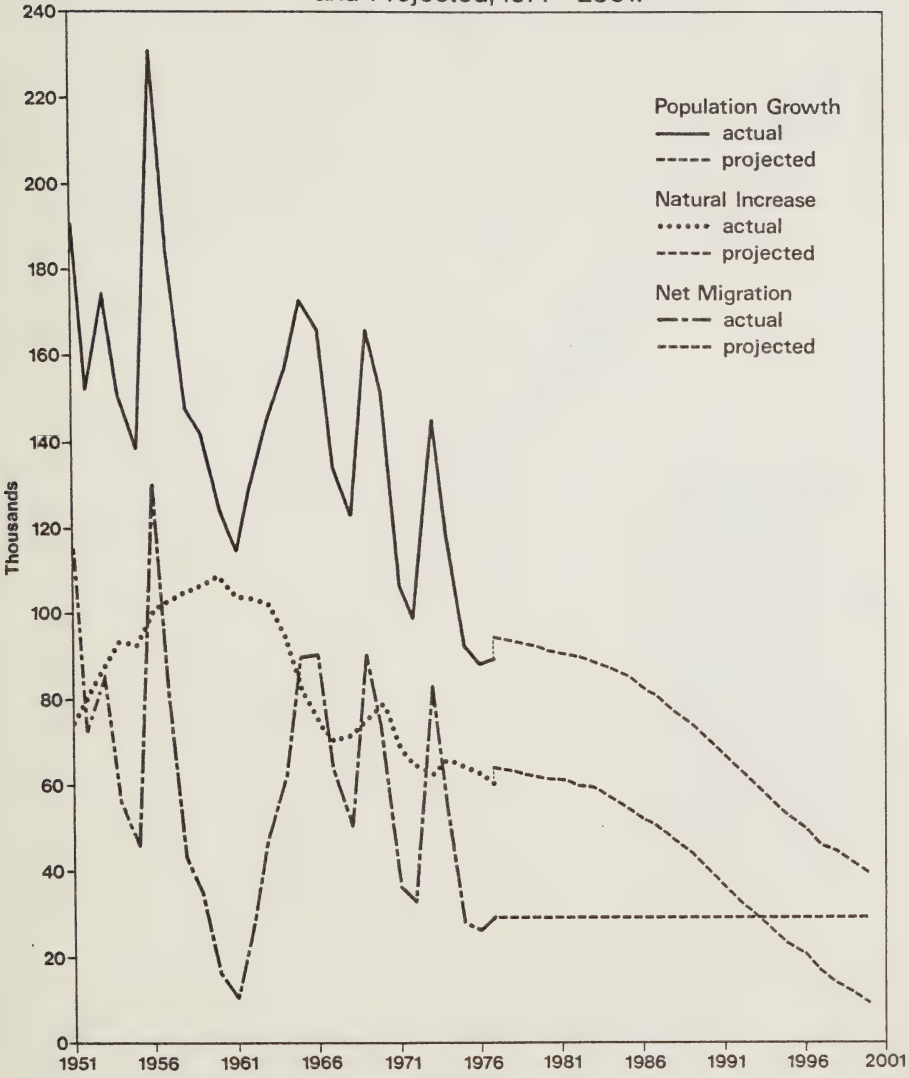

Ontario: Projected Fertility 1976–2001
(In Terms of Total Fertility Rate)
T.F.R.
2.80
2.50
2.20
1.90
1.60
1.30
1.00
1966
1971
1976
1981
1986
1991
1996
2001
High
High
Medium
Medium
Low
Low
1972 Population Projection Series
1978 Population Projection Series

Chart 4

Ontario: Components of Population Growth, 1951–1977 and Projected, 1977–2001.



Comparison of Five Population Projection Series: 1957, 1964, 1968, 1974, 1978

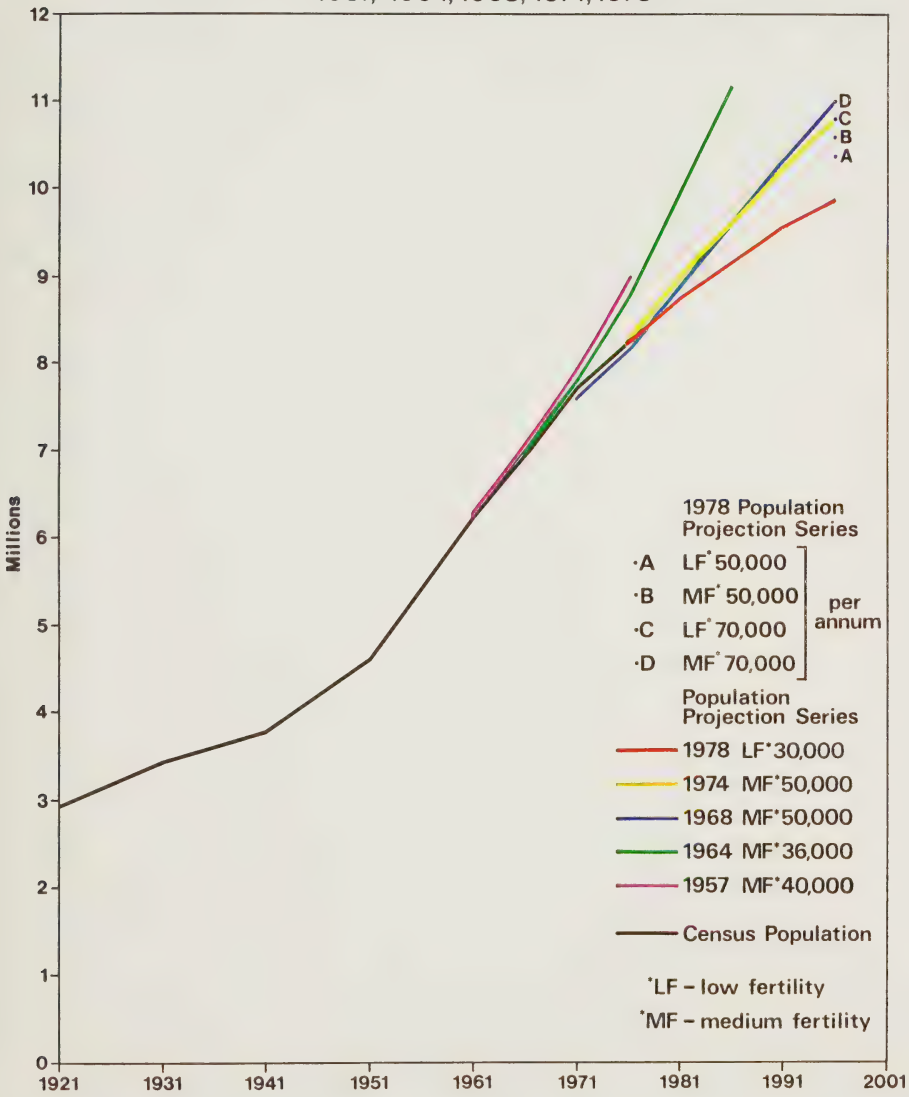


Chart 6

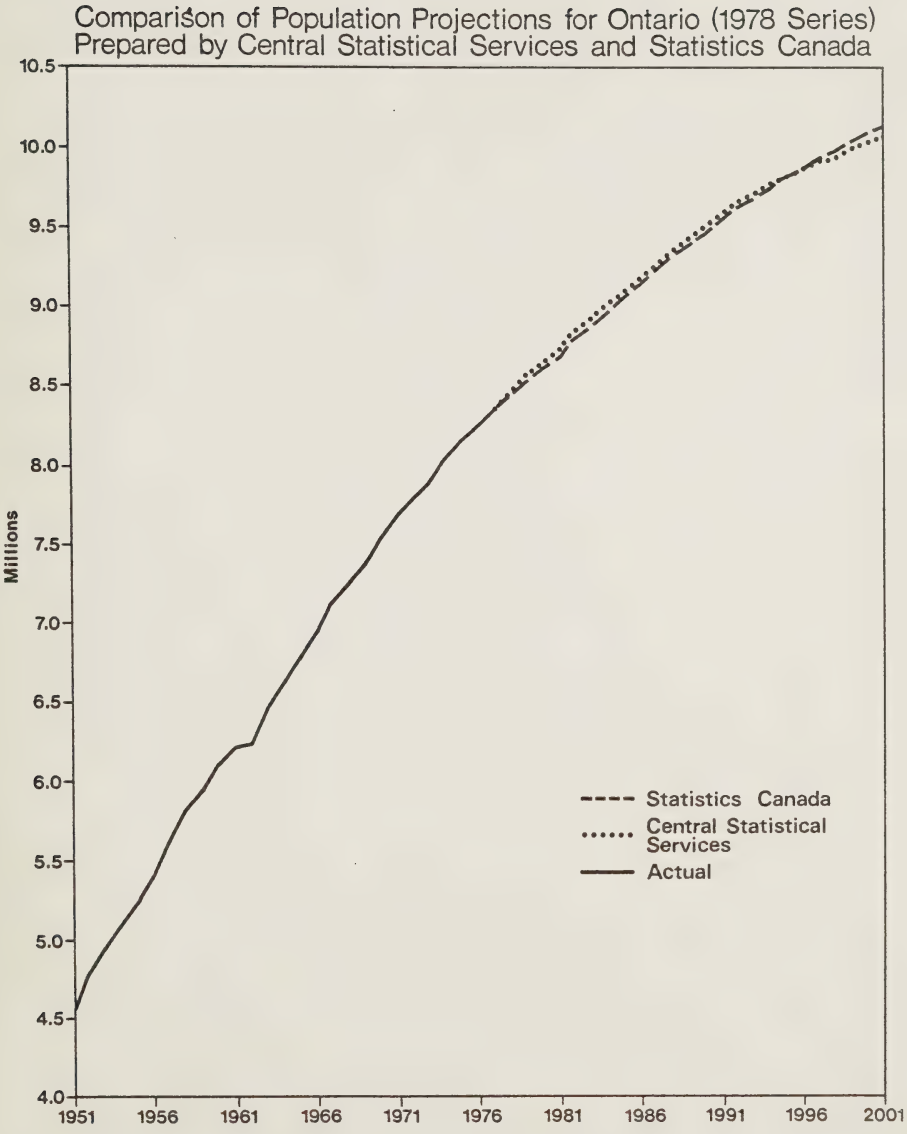
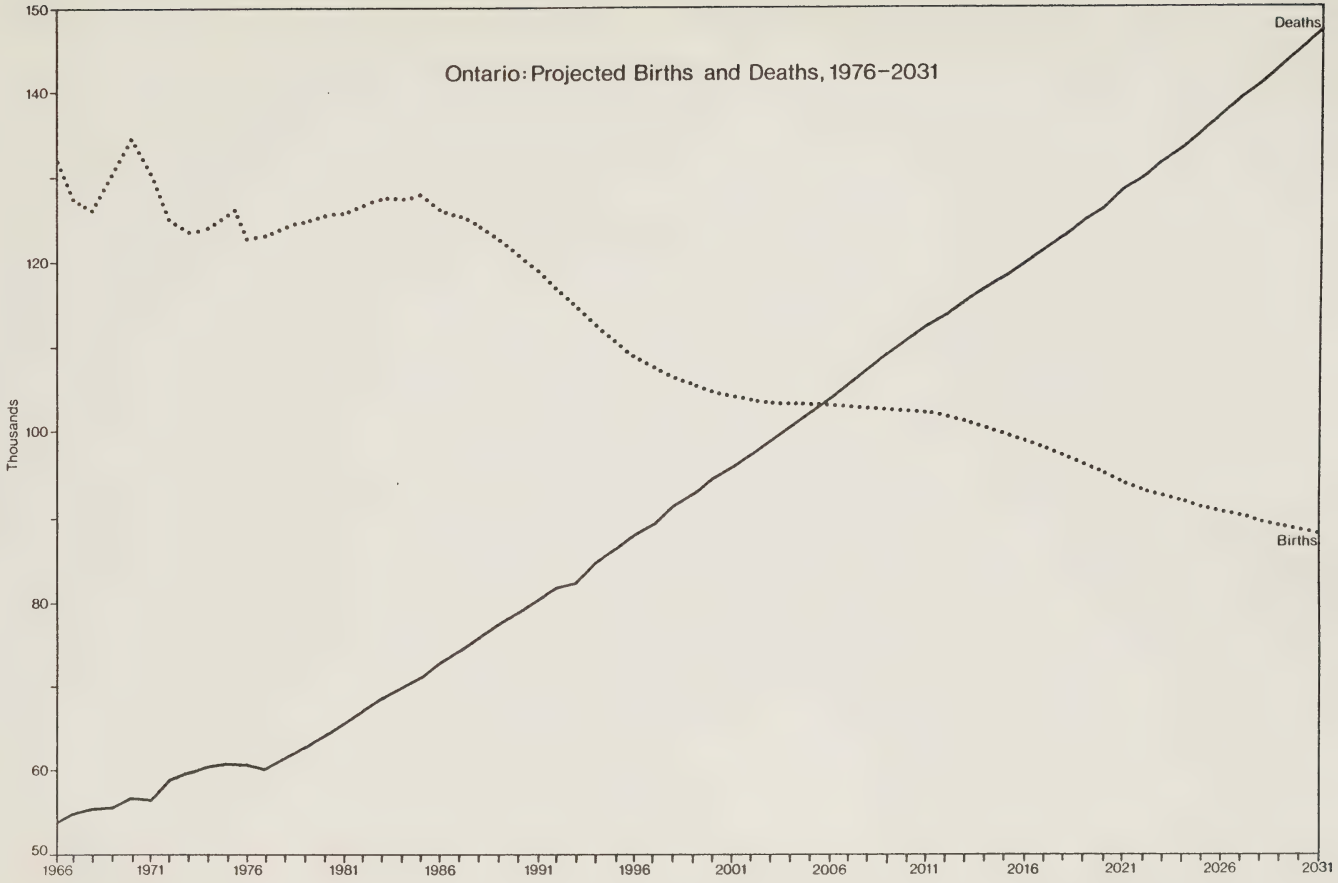

Comparison of Population Projections for Ontario (1978 Series)
Prepared by Central Statistical Services and Statistics Canada
Millions
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
1951
1956
1961
1966
1971
1976
1981
1986
1991
1996
2001
Statistics Canada
Central Statistical Services
Actual

Chart 7


Ontario: Projected Births and Deaths, 1976–2031
Deaths
Births
Thousands
150
140
120
100
80
60
50
1966
1971
1976
1981
1986
1991
1996
2001
2006
2011
2016
2021
2026
2031